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Maximum Weight of Trucks on Interstate System Highways: Variable Load Suspension Axles: Dummy Axles: Interpretation and Application of the Bridge Formula

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

23 CFR Part 657

[FHWA Docket No. 79-34]

Maximum Weight of Trucks on Interstate System Highways: Variable Load Suspension Axles: Dummy Axles: Interpretation and Application of the Bridge Formula

AGENCY: Federal Highway Administration (FHWA), DOT.

ACTION: Advance notice of proposed rulemaking.

SUMMARY: The Federal-Aid Highway Amendments of 1974, section 106(b), amended 23 U.S.C. 127 pertaining to the maximum weight of motor vehicles that may lawfully be permitted to use Interstate System highways. The amendment provided for a permissible increase in the maximum gross weight of a vehicle using the Interstate System from 73,280 pounds to 80,000 pounds gross weight, but conditioned that weight upon the application of the so-called "bridge formula," which is dependent on the number and spacing of the axles. The FHWA has interpreted the congressional intent in imposing the bridge formula application as requiring that all axles used in the formula must be capable of and in fact must be load-bearing axles. Thus, a "dummy" or "cheater" axle, one incapable of bearing a load, cannot be included in the bridge formula determination.

In response to an inquiry from the trucking industry, the FHWA also determined that a variable load suspension (VLS) axle provided the potential to serve as a dummy axle and, therefore, such axles also could not be counted under the bridge formula. A VLS axle is an axle upon which a load may be varied voluntarily while the vehicle is en route, whether by air, hydraulic, mechanical, or any combination of these means.

The National Truck Equipment Association has requested that this interpretation be modified in recognition of the true load-bearing capacity of the VLS axle.

The FHWA solicits comments on the Interpretation of the Statute as it relates to the use of the VLS axles.

DATES: Comments must be received on or before March 3, 1980.

ADDRESS: Submit written comments, preferably in triplicate, to FHWA Docket No. 79-34, Federal Highway Administration, Room 4205, HCC-10, 400 Seventh Street, SW., Washington, D.C. 20590. All comments received will be available for examination at the above address between 7:45 a.m. and 4:15 p.m., ET, Monday through Friday. These desiring notification of receipt of comments must include a self-addressed stamped postcard.

FOR FURTHER INFORMATION CONTACT: Mr. David C. Oliver, Attorney-Advisor, Motor Carrier and Highway Safety Law Division, (202) 426-0825. Office hours are 7:15 a.m. to 3:45 p.m. ET, Monday through Friday.

SUPPLEMENTARY INFORMATION: It has come to the attention of the Federal Highway Administration that there is a substantial amount of confusion as to the correct meaning of the amendments made to 23 U.S.C. 127 by section 106(b) of the Federal-Aid Highway Amendments of 1974, Pub. L. 93-643, 88 Stat. 2281. As amended, the statute provides in pertinent part, as follows:

> No (Interstate) funds * * * shall be apportioned to any State within the boundaries of which the Interstate System may lawfully be used by vehicles with weight in excess of (single axle, 20,000 pounds; tandem axle, 34,000 pounds; gross weight 80,000 pounds) * * * an overall gross weight on a group of two or more consecutive axles produced by application of the following formula:

$$W = 500\frac{LN}{N-1} + 12N + 36$$

> where W = overall gross weight on any group of two or more consecutive axles to the nearest 500 pounds, L = distance in feet between the extreme of any group of two or more consecutive axles, and N = number of axles in group under consideration, except that two consecutive sets of tandem axles may carry a gross load of 34,000 pounds each providing the overall distance between the first and last axles of such consecutive sets of tandem axles is thirty-six feet or more * * *.

The bridge formula requirement was inserted in order to ensure the distribution of weight over the truck configuration. This is particularly important as the ability of the road network to accommodate vehicular traffic is limited by the ability of its bridges to safely carry the sizes and weights operating over that network. Bridge investment has been estimated by the American Association of State Highway and Transportation Officials (AASHTO) to represent one-quarter of total highway investment and continued overstress or overstress in the unacceptable range will accelerate bridge deterioration and potential for collapse. Application of the bridge formula produces gross weight figures for all of the various configurations of trucks which would be safe on all existing Interstate bridges. Under the formula, greater weight can be achieved only by adding axles or adding length.

FHWA Interpretation—In response to an inquiry on the question of whether, for purposes of the bridge formula, an axle capable of carrying varying loads could be counted as one of the number of axles (N) in determining the weight of a group of axles, the FHWA interpreted section 127 as implying that all axles in which the load could be voluntarily varied en route, without regard to the suspension medium whether air, hydraulic, mechanical, or any combination thereof are analogous to dummy axles and could not be counted.

The bridge formula of 23 U.S.C. 127 is recognized in the AASHTO *Recommended Policy on Maximum Dimensions and Weights of Motor Vehicles To Be Operated Over the Highways of the United States,** which references dummy axles (Section 2.09.04) as follows: "Dummy axles shall not be considered in the determination of allowable loads." The dummy axle is defined as "A single axle attached independently to the frame of a vehicle and so designed and placed as to indicate the appearance of a normal tandem axle."

While the Congress in enacting the bridge formula of section 127 did not specifically refer to the AASHTO recommended policy, the policy does provide guidance in interpreting the application of the bridge formula among the States. In accordance with the AASHTO proscription it has been and continues to be the FHWA interpretation that an axle incapable of bearing a load cannot be counted in the bridge formula application.

However, it was the FHWA interpretation at that time that VLS axles while they possessed the capability of serving as true load-bearing axles, could serve with equal facility as dummy axles and as such could not be counted under the bridge formula. It appeared at the time that the potential for abuse was of sufficient magnitude to proscribe such axles. For example, a three-axle trailer group meeting the formula requirements could bear a weight of 42,500 pounds. If the front axle of the group is a VLS axle under the control of the driver in the cab, the load on the axle could be reduced to a nominal amount. This

*American Association of State Highway and Transportation Officials, 444 North Capitol Street, NW., Washington, D.C.

would increase the weight upon the remaining two axles in the group. For discussion purposes, assume the weight on the variable axle is reduced to 2,500 pounds. The remaining axles in the group would bear 40,000 pounds which exceeds the amount applicable under the formula. The interpretation was issued to discourage this type of excessively concentrated loading. While section 127 contains no express requirement that axles within a group must be articulated or substantially equalized as to weight in order to be counted, there is an implication that no axle can be manipulated in such a way as to make the remaining axles in the group bear more weight than the formula allows. This position is founded in both the spirit and the letter of 23 U.S.C. 127. In summary, the FHWA believes that any device which may be operated or activated by a truck operator, and which may be potentially damaging to highway structures and pavement, should be prohibited or not be counted in the computation of allowable loads.

Trade Association Position—The National Truck Equipment Association (NTEA), a trade association composed of "approximately 750 truck equipment manufacturers and distributors," through its standing committee, the Variable Load Suspension Axle Manufacturer's Committee, has taken issue with the FHWA position. The NTEA believes that confusion has developed because of an erroneous assumption that dummy or cheater axles are a type of VLS. The NTEA correctly characterizes the dummy axle as an axle attached to a vehicle frame to give the appearance of a load carrying axle, when it is not. Such suspensions are not adjustable and there is no way to equalize the load. A VLS is used to equalize the load when required and to transfer the load to the drive axle when the vehicle is not fully loaded or when advantageous under adverse conditions for vehicle safety to improve traction and directional control. In other words, a VLS is an actual load carrying axle. The NTEA acknowledges that a VLS can be unequalized or lifted when running loaded, and that this is misuse, but maintains that the known economic deterioration and loss of ride comfort from such misuse are significant self-enforcers of proper use.

NTEA contends that VLS axles can add materially to vehicle safety. Traction, braking, driver fatigue, equalization, maneuverability and control, cargo protection, and safety equipment are all enhanced. More importantly, the NTEA's position is that VLS are less destructive to road and bridge surfaces than alternative design. For example:

- Independent axle movement with VLS allows the axle to react to major surface irregularities without transferring load to another axle causing a severe overload when the following axle encounters the problem area.
- The VLS can be mounted in any position that allows the load to be distributed for better equalization and offers design flexibility that allows conformance to the bridge formula.

The VLS is lighter than dual drive which lightens the highway loading when the truck is loaded to any point lower than Gross Vehicle Weight Rating (GVWR).

- Road surface compliance and a softer ride allow the VLS vehicle to develop less tire squirm which results in less friction at the tire road interface, substantially reducing highway surface wear.

There are also benefits claimed with respect to resource conservation, particularly the ability to reduce consumption of petroleum and petroleum products. These include fuel savings and reduced tire wear.

The GAO Report—On July 16, 1979, the General Accounting Office issued a report, entitled "Excessive Truck Weight: An Expensive Burden We Can No Longer Support" (GAO report). That report chronicles the increasing problem we face as a result of highway deterioration. The report characterizes excessive truck weight as a major factor leading to highway deterioration and concludes that eliminating excessively heavy trucks from the highways will help preserve the Federal investment at relatively little cost compared to funding needs if truck weights are not controlled. The report detailed the excessive weight problem with respect to trucks hauling steel products, agricultural products, petroleum products, natural resource haulers, and urban hauling.

The discussion of natural resource haulers is pertinent to the issue at hand. The GAO report states that the damage caused by overweight trucks is most apparent in those areas where trucks hauling natural resources are making numerous short trips on the same roads. The report states: "Natural resource firms are often dominant economic forces and can exert considerable economic and political pressure to continue unrestricted operations. Such pressure can reduce weight enforcement or severely limit its effectiveness" (p. 15).

The report then specifies problems in the Appalachian coal haul area, where coal hauling has severely impacted the Federal-aid systems. It is of particular interest that the GAO found that much of the coal is hauled by large three and four-axle dump trucks and five-axle tractor-trailers. Logging operations, sand and gravel hauling, and urban trucking were also addressed. In the urban areas truck traffic was found to be concentrated at such locations as port facilities, gravel pits, construction sites, dumps, and incinerators. Single-unit trucks including dump trucks, concrete mixers, and trash haulers, hauling sand, gravel, and excavation materials often exceed weight limits.

Discussion—Both the NTEA and the GAO comments relate to the fundamental dilemma in which the FHWA finds itself. The FHWA has the mandate to ensure that Federal-aid highways are preserved for the use of the traveling public in accordance with service-life expectations. However, enforcement is a State prerogative. It is acknowledged by both sources that misuse of an otherwise technologically beneficial tool will result in faster deterioration of the highways than is desirable. Thus, the ultimate problem may be one of enforcement. If this is the situation, the short-term solutions may not be acceptable. There are approximately 50,000 or more VLS axles produced every year with heavy usage among the specialized haulers detailed in the GAO report. Dump trucks, concrete mixers, and dump trailers all can utilize the VLS. Insofar as these vehicles operate off the Interstate System, which appears a fair assumption to make in light of the GAO report, continuation of the FHWA ruling against including the axle in the bridge formula computation will not severely inhibit the industry's expansion. This would not, however, address the problem with respect to the non-Interstate Federal-aid systems.

The NTEA has indicated that if misuse is occurring, appropriate action should be taken to stop it. The NTEA has offered its assistance in ascertaining the incidence of misuse and in exploring possible solutions. The NTEA is concerned over the application of the FHWA interpretation because one State, Georgia, has recently enacted a law following this interpretation. In this respect, we would like information from Georgia on this issue. We are also interested in hearing from enforcement officials in areas where the VLS is heavily used. The States of Louisiana, Kentucky, West Virginia, Wisconsin, and Ohio may have experience which is helpful in resolving this issue.

At the same time, the FHWA will institute research into the nature and incidence of the problem.

While it is our belief that the potential damage caused by the abuse of the VLS justifies the original interpretation, the FHWA is willing to suspend the application of that interpretation until various alternatives are explored in order to ensure that no unnecessary hardships are created by its application. The alternatives under consideration include the following:

1. No change in the interpretation—the VLS will continue to be proscribed from the bridge formula computation necessary to establish the maximum weight on the Interstate System.

2. Abrogate the interpretation. This will leave it up to the individual States to take the initiative with respect to the VLS.

3. Abrogate the interpretation and require all States to permit VLS axles to be counted in the bridge formula.

4. Modify the interpretation to permit the inclusion of VLS axles which cannot be operated from the cab while the vehicle is en route.

5. Abrogate the interpretation and issue a regulation requiring those States which permit inclusion of VLS axles in the bridge formula to impose stiff penalties on violators sufficient to deter violations.

6. Abrogate the interpretation and issue a regulation requiring those States which permit inclusion of VLS axles in the bridge formula to require the posting of a bond sufficient to compensate for pavement and bridge damage.

The FHWA is also willing to consider any other alternative not included above. Comments will be welcome on the possible benefits of permitting the VLS axles to be included in the bridge formula including fuel efficiency and inflationary impacts, as well as enforcement problems and adverse impacts resulting from misuse of the VLS axle.

As only one State to our knowledge specifically prohibits by law the inclusion of the VLS axle in the bridge formula formulation, the FHWA is suspending the mandatory application of the interpretation until all alternatives have been explored. During this interim period, the States may take whatever action they feel necessary to address VLS axle usage.

This advance notice of proposed rulemaking is issued under the authority of 23 U.S.C. 127, 141, 315, and the delegation of authority by the Secretary of Transportation at 49 CFR 1.48(b).

Note.—The Federal Highway Administration has determined that this document does not contain a significant proposal according to the criteria established by the Department of Transportation pursuant to E.O. 12044. The impact of this rule is indeterminate at this time and does not warrant the preparation of a regulatory evaluation. Once the alternatives have been examined and a final decision has been made on the need for a regulation, a regulatory evaluation will be prepared and placed in the docket.

Issued on: November 20, 1979.

Karl S. Bowers,

Federal Highway Administrator.

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